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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,652	08/02/2002	Luca Becchetti	2001-0109	3716

26652 7590 11/16/2006

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EXAMINER
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DUONG, FRANK

ART UNIT	PAPER NUMBER
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2616

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/064,652

Applicant(s)

BECCHETTI ET AL.

Examiner

Frank Duong

Art Unit

2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This Office Action is a response to communications dated 09/18/06. Claims 1-18 are pending in the application.

#### ***Specification***

2. The disclosure is objected to because of the following informalities:

Page 21, "Figures" should be deleted.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1-18 are rejected under 35 U.S.C. 102(a) as being anticipated by Nandagopal (SCHEDULING FOR FAIRNESS AND MINIMAL RESPONSE TIMES IN WIRELESS DATA NETWORKS, Ph.D. in Electrical Engineering, University of Illinois at Urbana-Champaign, PAGES 1-98, May 2002) (hereinafter "Nandagopal").

Regarding **claim 1**, in accordance with Nandagopal reference entirety, Nandagopal discloses a method of scheduling data transmissions in a wireless data network, comprising:

(a) receiving a request to transmit data of a size  $s$  to a receiver (*page 47, first paragraph, Nandagopal discloses user makes a request. The size  $s_i$  (in bits) and the channel gain of request are known*);

(b) using the request size  $s$  and transmission characteristics to the receiver to select overall power and number of codes to assign to the request over an entire schedule (*page 47, Nandagopal discloses scheduling problem is to determine an assignment of power and codes to each user in each time slot assuming the channel conditions of the user are constant over the scheduling period. Examples of offline and online scheduling are given on pages 55-64*);

(c) rounding results from step (b) so that every selected code is assigned a power that achieves a feasible data rate (*pages 65-68, Nandagopal discusses the implementation of rounding scheme that turns a solution for the continuous case into a solution of the discrete case*); and

(d) allocating the results of step (c) in each scheduling frame in accordance with a quality of service metric (*pages 68-68, Nandagopal discussed the QoS criteria*).

Regarding **claim 2**, in addition to features recited in base claim 1 (see rationales discussed above), Nandagopal further discloses wherein the overall power and the number of codes is selected using resource augmented competitive analysis (*pages 79-83, Nandagopal discusses the resource augmentation*).

Regarding **claim 3**, in addition to features recited in base claim 2 (see rationales discussed above), Nandagopal further discloses wherein the overall power  $p$  and the number of codes  $k$  is selected to minimize the following expression:  $(P_i^C/P) + (K^C_J/C)$

where  $P$  is the total power that is transmitted and  $C$  is the total number of codes that is assigned to receivers in a time frame in the schedule (*pages 59-64, especially equation 3.9 on page 61*).

Regarding **claim 4**, in addition to features recited in base claim 3 (see rationales discussed above), Nandagopal further discloses wherein  $p$  and  $k$  are selected with respect to a resource-augmented demand (*page 65, last paragraph and thereafter*).

Regarding **claim 5**, in addition to features recited in base claim 1 (see rationales discussed above), Nandagopal further discloses wherein the quality of service metric comprises minimizing maximum response time of data transmission (*page 67, equation 3.20 and thereafter*).

Regarding **claim 6**, in addition to features recited in base claim 1 (see rationales discussed above), Nandagopal further discloses wherein the quality of service metric comprises minimizing a weighted response time of data transmission (*page 68, last paragraph and thereafter*).

Regarding **claim 7**, in addition to features recited in base claim 1 (see rationales discussed above), Nandagopal further discloses wherein the quality of service metric comprises maximizing stretch of data transmission (*page 69, first paragraph and thereafter*).

Regarding **claim 8**, in addition to features recited in base claim 1 (see rationales discussed above), Nandagopal further discloses wherein the quality of service metric comprises maximizing flow of data transmission (**page 74, Table 3.2 and thereafter**).

Regarding **claim 9**, in accordance with Nandagopal reference entirety, Nandagopal discloses a method of scheduling data transmissions in a wireless data network, comprising:

(a) receiving a request to transmit data of a size  $s$  to a receiver (*page 47, first paragraph, Nandagopal discloses user makes a request. The size  $s_i$  (in bits) and the channel gain of request are known*);

(b) using the request size  $s$  and transmission characteristics to the receiver to select overall power and number of codes to assign to the request over an entire schedule, such that the power  $p$  and number of codes  $k$  minimizes the expression  $(P_i^C/P) + (K_i^C/C)$  (*pages 59-64, especially equation 3.9 on page 61*) where  $P$  is the total power that can be transmitted and  $C$  is the total number of codes that can be assigned to receivers in a time frame in the schedule (*page 47, Nandagopal discloses scheduling problem is to determine an assignment of power and codes to each user in each time slot assuming the channel conditions of the user are constant over the scheduling period. Examples of offline and online scheduling are given on pages 55-64*); and

(c) allocating the results of step (b) in each scheduling frame in accordance with a quality of service metric (*pages 68-68, Nandagopal discussed the QoS criteria*).

Regarding **claim 10**, in addition to features recited in base claim 9 (see rationales discussed above), Nandagopal further discloses wherein  $p$  and  $k$  are selected with respect to a resource-augmented demand (*page 65, last paragraph and thereafter*).

Regarding **claim 11**, in addition to features recited in base claim 9 (see rationales discussed above), Nandagopal further discloses wherein the quality of service metric comprises minimizing maximum response time of data transmission (*page 67, equation 3.20 and thereafter*).

Regarding **claim 12**, in addition to features recited in base claim 9 (see rationales discussed above), Nandagopal further discloses wherein the quality of service metric comprises minimizing a weighted response time of data transmission (*page 68, last paragraph and thereafter*).

Regarding **claim 13**, in accordance with Nandagopal reference entirety, Nandagopal discloses a method of scheduling data transmissions in a wireless data network, comprising:

(a) receiving a request to transmit data of a size  $s$  to a receiver (*page 47, first paragraph, Nandagopal discloses user makes a request. The size  $s_i$  (in bits) and the channel gain of request are known*);

(b) using the request size  $s$  and the transmission characteristics to the receiver to select a number of codes needed to complete the request using a power of  $P/C$  per code assuming a reduced demand (*page 47, Nandagopal discloses scheduling problem is to determine an assignment of power and codes to each user in each time slot assuming the channel conditions of the user are constant over the scheduling period. Examples of offline and online scheduling are given on pages 55-64*); and

(c) rounding results from step (b) so that every selected codes is assigned a power that achieves a feasible data rate (*pages 65-68, Nandagopal discusses the*

*implementation of rounding scheme that turns a solution for the continuous case into a solution of the discrete case); and*

(d) allocating the results of step (c) in each scheduling frame in accordance with a quality of service metric (*pages 68-68, Nandagopal discussed the QoS criteria*).

Regarding **claim 14**, in addition to features recited in base claim 13 (see rationales discussed above), Nandagopal further discloses wherein, if a request satisfying the quality of service metric leaves unused power/codes in that scheduling frame, then another request is packed into the scheduling frame (*page 71; 2D-FIFO*).

Regarding **claim 15**, in addition to features recited in base claim 13 (see rationales discussed above), Nandagopal further discloses wherein the request with an earlier release time has higher priority over other requests (*page 71; 2D-FIFO*).

Regarding **claim 16**, in addition to features recited in base claim 14 (see rationales discussed above), Nandagopal further discloses wherein, if the request with the earliest release time leaves power/codes unused in that scheduling frame, then another request is packed into the scheduling frame (*page 71; 2D-FIFO*).

Regarding **claim 17**, in addition to features recited in base claim 13 (see rationales discussed above), Nandagopal further discloses wherein the request with a highest value of power per code has higher priority over other requests (*page 71; 2D-PIKI*).

Regarding **claim 18**, in addition to features recited in base claim 17 (see rationales discussed above), Nandagopal further discloses wherein, if the request with



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the highest value of power per code leaves power/codes unused in that scheduling frame, then another request is packed into the scheduling frame (*page 71; 2D-PIKI*).

### ***Response to Arguments***

4. Applicants' arguments filed 09/18/06 have been fully considered but they are not persuasive.

In the Remarks of the outstanding response filed 09/18/06 pertaining the rejection under 35 U.S.C. §102(a) of claims 1-18, Applicants argue the applied art is not qualified as a 102(a) reference.

In response Examiner respectfully disagrees and asserts the prior art of Nandagopal has been properly applied in the Office Action until the Applicants introduce evidence to prove otherwise.

Due to the arguments are not persuasive and the communications dated 09/18/06 fails to place the instant application in a favorable condition for allowance, the rejection is maintained.

### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

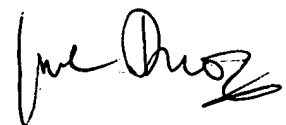
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Duong whose telephone number is 571-272-3164. The examiner can normally be reached on 7:00AM-3:30PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ahmad Matar can be reached on 571-272-7488. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

November 13, 2006



**FRANK DUONG**  
**PRIMARY EXAMINER**